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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/758,667	01/11/2001	Russell R. Krug	005950-656	9538
7590 03/30/2004			EXAMINER	
E. Joseph Gess BURNS, DOANE, SWECKER & MATHIS, L.L.P. P.O. Box 1404 Alexandria, VA 22313-1404			GRIFFIN, WALTER DEAN	
			ART UNIT	PAPER NUMBER
			1764	

DATE MAILED: 03/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/758,667

Applicant(s)

KRUG ET AL.

Examiner

Walter D. Griffin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 February 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 and 22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 20 is/are allowed.
- 6) ☒ Claim(s) 1-19 and 22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

The objection to the specification and the rejection of claim 21 as described in the paper mailed on November 18, 2003 have been withdrawn in view of the amendment filed on February 17, 2004.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-5, 12, 13, 15-19, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Anderson (US 2,620,365) in view of Huss, Jr. et al. (US 4,935,577).

The Anderson reference discloses a process for making a lube oil. The process is a two-step process that comprises a first isomerization step in which a high boiling olefinic feed is isomerized and a second step in which the isomerized feed is oligomerized to produce a product comprising a lube oil. The oligomerized product is fractionated to recover the lube oil. The lube oil may be hydrogenated to stabilize the oil to oxidation. The feed is obtained from a CO-H₂ synthesis process (i.e., an F-T process). The carbon number range for the olefins in the feed is such that the feed would necessarily have boiling points greater than the claimed temperatures. The product would necessarily have the claimed characteristics. See column 1, lines 1-10 and 37-48; column 6, lines 26-55; column 7, lines 4-72; column 8, lines 5-20; and the examples.

The Anderson reference does not disclose catalytic distillation. It also does not disclose recovering the fractions as in claim 18.

The Huss reference discloses an oligomerization process utilizing a catalyst comprising a Lewis acid promoted non-zeolitic solid inorganic oxide, large pore crystalline molecular sieve and/or ion exchange resin, which can be in the presence of water, which is effected by catalytic distillation techniques. More specifically, the subject process is directed to an alpha-olefin that is oligomerized in the presence of a catalyst comprising boron trifluoride and a minute amount of water in a particular adsorbent material such as silica to a product predominating in those oligomers fractions having viscosities within the lubricating oil range such as the trimer and tetramer of 1-decene. This is the preferred alpha-olefin for this oligomerization. However, 1-olefins having from 3 to 20 carbon atoms and preferably 8 to 12 carbon atoms or various

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combinations of these alpha-olefins can also be used. Straight chain olefins are preferred. The solid adsorbent material of the invention may be selected from among the diverse inorganic oxides including alumina, silica, boria, oxides of phosphorus, titanium dioxide, zirconium dioxide, chromia, zinc oxide, magnesia, calcium oxide, silica-alumina, silica- magnesia, silica-alumina-magnesia, silica-alumina-zirconia. The reactants are introduced into the catalyst bed or reaction area. Product is withdrawn from beneath the reaction area, while unreacted reactants are withdrawn above the reaction zone. See the entire document.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Anderson by utilizing a catalytic distillation technique during the oligomerization reaction as suggested by Huss because certain advantages such as lower energy requirements, higher yields, good product purity, and lower capital investment will be achieved.

It also would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Anderson by recovering the claimed products because one would recover any product fractions depending on the intended use of the fraction.

Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Anderson (US 2,620,365) in view of Huss, Jr. et al. (US 4,935,577) as applied to claim 1 above, and further in view of WO 95/21872.

None of the previously discussed references discloses the use of an acidic ionic liquid catalyst.

The WO 95/21872 reference discloses that ionic liquids are effective catalysts for oligomerizing olefins. After the oligomerization process, the product is separated from the catalyst and the catalyst can be recycled. See page 1, lines 1-5 and page 8, lines 31-33.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the previously discussed references by utilizing an ionic liquid catalyst in the manner as suggested by the WO 95/21872 reference because the resulting product can be easily separated from the catalyst thereby minimizing undesirable reactions.

Claims 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Anderson (US 2,620,365) in view of Huss, Jr. et al. (US 4,935,577) as applied to claim 1 above, and further in view of EP 0673352B1.

The previously discussed references do not disclose the use of a Group VIII metal on a support such as a zeolite.

The EP 0673352B1 reference discloses the use of a zeolite catalyst such as a ZSM-5 zeolite catalyst. The catalyst can contain nickel. See paragraph [0028].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the previously discussed reference by utilizing a zeolite catalyst as suggested by the EP reference because such a catalyst is effective for the oligomerization of olefins.

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Anderson (US 2,620,365) in view of Huss, Jr. et al. (US 4,935,577) as applied to claim 12 above, and further in view of Vora et al. (US 6,025,533).

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The previously discussed references do not disclose sending a fraction of the light by-product to an olefin-forming reactor.

The Vora reference discloses sending a non-olefinic stream recovered from an oligomerization zone to a dehydrogenation zone. See column 4, line 30 through column 6, line 19.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the previously discussed references by recycling a non-olefinic stream as suggested by Vora because additional olefins will be produced which will lead to additional oligomerized product being produced.

Allowable Subject Matter

Claim 20 is allowed.

The following is a statement of reasons for the indication of allowable subject matter: Claim 20 is indicated as being allowable because the prior art of record does not disclose or suggest a process as claimed that includes the isomerization of a diolefin-containing feed, selectively hydrogenating the isomerized feed, and then oligomerizing the feed in a catalytic distillation zone.

Response to Arguments

The argument that the claimed process comprises skeletal isomerization whereas the Anderson reference discloses double bond shift isomerization is not persuasive. Anderson states that it appears that the lowering of the melting point is due to shifting of the double bond in the

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molecule. See column 1, lines 45-48. This language indicates that Anderson is unsure of the exact reaction mechanism and applicant has not shown that the claimed isomerization reaction is any different from that which is disclosed by Anderson. Additionally, Anderson's description of the isomerization reaction does not exclude skeletal isomerization.

The argument that the Huss reference does not disclose or suggest the claimed single oligomerization is not persuasive. The Huss reference is utilized to show that catalytic distillation techniques can be used to oligomerize olefins and discloses advantages resulting from these techniques. Applicant has not shown that one would not be motivated to apply the techniques of Huss to the process of Anderson to obtain these advantages.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

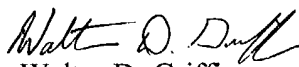
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Walter D. Griffin whose telephone number is (571) 272-1447. The examiner can normally be reached on Monday-Friday 6:30 to 4:00 with alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Walter D. Griffin
Primary Examiner
Art Unit 1764

WG

March 23, 2004